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THE GENESIS OF AN EPIDEMIC OF PUERPERAL FEVER.

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THE GENESIS OF AN EPIDEMIC OF PUERPERAL FEVER.

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During the early months of the year 1874, the Lying-in Department of the Bellevue Hospital, in this city, was visited by an epidemic of puerperal fever of singular intensity and violence, which led finally to the transfer of the obstetrical service from the Bellevue to the Charity Hospital. It has seemed to me that it would be a profitable task to trace, so far as it is possible, the origin, progress, and growth of the epidemic, to serve for future guidance and warning.

A glance at the casualties of the second half of the preceding year, will, perhaps, serve to bring into sharper contrast the distinction between ordinary puerperal accidents, common, alas, to both civil and hospital practice, and the raging of a monstrous pestilence, for which large hospitals, viciously conducted, alone furnish the atmosphere, the soil, and the means of expansion.

It is important, however, at the outset, not to be misled into regarding so-called hospitalism as a distinct entity, instead of a sum of ponderable factors. It is not to be gotten rid of by childish expedients. Holy water will not exorcise it. The latest vagary in hospital construction fails to solve the problem

of its extinction. Mastery of hospital evils must come from acquaintance with not one, but all the elements out of which such evils are generated.

During the summer months of 1873 the hospital enjoyed an almost complete immunity from puerperal disorders. From the 11th of May to the 26th of August there were 136 confinements, without a single death. On the latter date Mary G., a primipara, single, after a severe labor lasting thirty-seven hours, was delivered by forceps by the house-physician at that time on duty in the obstetrical service. The os is reported as having been rigid at the time of the operation, and the dilatation only partially completed. The perineum was badly ruptured. The patient subsequently died of peritonitis. The peritonitis was of a purely traumatic character, and though terminating fatally, did not perceptibly influence the health of the service.

On the 12th of September Mary S., single, æt. 21, primip., was delivered by forceps, after a prolonged labor of fifty hours. A rigid cervix demanded the preliminary employment of Barnes's dilators. Six days later this patient's temperature went up to 103¾°. With this exception she did well, and made a rapid recovery.

On the same day (September 12th) Bridget K., married, æt. 38, sixth pregnancy, was delivered by forceps on account of an attack of puerperal convulsions. The child weighed 10 lbs. 14 oz. The patient developed on the third day slight tenderness along the femoral vein, and was transferred to a medical division, but made a good recovery.

On the 13th instant Kate R., single, æt. 29, primip., was delivered naturally after a labor lasting nearly thirty-five hours. On the 15th instant she was transferred to a medical division on account of tenderness in the left iliac fossa. Recovered.

On the 17th inst. Mary H., mar., æt. 35, sixth preg., had a high temperature soon after delivery, and was accordingly transferred to a medical division, where she speedily recovered.

Though as yet no deaths had occurred, these four cases excited so much uneasiness on my part that I directed the closure of the confinement ward, and the room next adjacent in which the puerperal women were ordinarily retained during the first four days following parturition. Meantime Medical

Ward 24 was placed by the warden, Mr. Brennan, at my disposal for subsequent confinements. The necessity for this action was demonstrated by the fact that Ann R., the last patient confined in the old ward, likewise had for two days a temperature of 104°, and a rather slow convalescence.

On the 21st inst., *i.e.*, after the change had been made, six patients were confined. Of these, Hannah H., married, æt. 32, tenth preg., suddenly exhibited symptoms of collapse, which proved to be the result of spontaneous rupture of the uterus. She died at 7 A.M. Two of the six patients were confined before her death took place, and two after the corpse had been removed from the room. All these did well. One, however, Jennie T., single, æt. 22, primip., was in labor at the time of Hannah's death, and witnessed the painful scenes that closed her life. This patient manifested at the time intense mental distress. On the third day she developed symptoms of peritonitis, and died October 2d. In this case it would be absurd to refer the death to a hospital poison. The rapid recovery of four other patients, confined on the same day, and by the same attendants, demonstrates this. She died precisely as any young, nervous, unmarried primipara would have done in civil practice, after having been subjected to a similar shock during labor.

On the 29th of Sept. there were two confinements. One, Margaret W., had an attack of cellulitis, following rupture of the perineum. The other, Mary H., single, æt. 27, primip., had an easy confinement. She had, however, entered the hospital some months previous, to conceal herself from her friends, whose anger she greatly dreaded. The day after her delivery she was accidentally discovered in the lying-in ward by her sister, who came to her bedside, and there cursed her, and loaded her with reproaches. This sister's language was so violent that it became necessary to summon the hospital police, and expel her from the precincts by force. Soon after this occurrence the patient became maniacal, developed symptoms of peritonitis, and died on the 5th of October.

Thus among the patients confined in the month of September one died from spontaneous rupture of the uterus, and two from peritonitis apparently arising out of excessive mental emotion.

The month of October was singularly free from metritic disorders, and yet there were three deaths. 1st, Mary C., brought into hospital three weeks *after* confinement, with cerebral embolism. 2d, Ellen Mc., who had uræmic convulsions *after* delivery. All attempts to excite a sufficient urinary secretion proved ineffective. 3d, Laura B., sent into hospital after labor had commenced. This patient was in the last stages of consumption, so that it was found she would hardly live to the completion of labor. In fact she expired a few hours after the birth of her child.

Besides these cases, in the same month Ellen C., a prisoner, sent to the Hospital to be confined, previous to her transfer to the Penitentiary on Blackwell's Island, developed puerperal mania.

On the 1st of November the regular ward of the obstetrical service, which had been closed from the 20th of September, for purposes of disinfection, was once more reopened.

The first patient, Mary C., married, æt. 38, fourth preg., was sent to the hospital from a so-called "private asylum" in the city. She was, on her arrival, in a weak and anæmic condition. The house-physician, Dr. Fleming, found the cervix, on digital examination, in a soft and dilatable condition. On withdrawing his finger he found it covered with dark, grumous blood. I was at once summoned, and on introducing my hand found that it passed directly through an extensive laceration in the posterior uterine wall into the abdominal cavity. I at once extracted the child, which proved to be in an advanced state of decomposition. The patient died twenty-four hours afterward of shock. She did not in any way affect the health of the service, as shown by the fact that the succeeding seventeen cases had not one dubious symptom.

The eighteenth case, Jennie M., married, æt. 33, eighth preg., was delivered Nov. 10th, after a labor lasting forty-nine hours thirty min. The first stage was very tedious, lasting forty-nine hrs. ten min. The anterior lip of the cervix became very œdematous. The expulsion of the child followed, however, five minutes after the rupture of the membranes. In her three previous labors she had been delivered by forceps of still-born children. On the afternoon of the third day (12th inst.) her temperature rose to $104\frac{3}{4}^{\circ}$, P. 140, R. 34. The day following the

record shows T. 106½°, P. 126, R. 36. On the 14th inst., T. 102½°, P. 120, R. 126. Patient was feeling more comfortable. On the 15th inst., the patient being well under the influence of opium, the respirations fell to 18, P. 132, T. 103½°. The abdomen was tympanitic, and tender on pressure. The skin was moist and the face flushed. On the 16th inst. she was transferred to Med. Ward 23, where her temperature rose to a high point, not specifically recorded, the pulse became rapid and feeble, and the abdomen excessively tympanitic. Six hours after her transfer the patient died. The autopsy was made by Dr. Delafield, who simply reported, "No lesion found except slight endometritis. No peritonitis."

I have been thus specific, because this patient, in contrast to the others whose cases terminated fatally, exercised for a long period of time a most pernicious influence upon the obstetric department. Indeed it is a question whether we may not fairly ascribe to her the starting-point of the epidemic which subsequently assumed such terrific proportions. Yet at the time of her confinement the health of the service was excellent. All the patients were doing well. No change had been made in the attendance. There was nothing but the long labor to apparently account for the fatal issue.

One point in her history, however, deserves to be noted. My attention was drawn to the patient in the month of July previous, when she claimed to have reached the ninth month of pregnancy. The question then arose as to the advisability, in view of the death of the three previous children during parturition, of inducing premature labor in the interest of the unborn child. On examination, however, in spite of her positive statement, the pregnancy proved to be not further advanced than the fifth month. The patient was very rebellious when informed of the fact, and persisted in remaining in the wards devoted to the puerperal women, where she was employed as a helper by the nurses, up to the time of her confinement, four months afterwards.

The effect of this case of fever did not at once manifest itself, for one patient confined on the 11th inst., one on the 14th inst., and two on the 16th inst., all made good recoveries. It was, too, some time before a single fatal case occurred. The prevalence of elevated temperatures, accompanied by a quickened,

or what is euphemistically termed "a hospital pulse," gave, however, the warning of impending danger. It will be remembered that Jennie M. was the eighteenth patient confined during the month. The 23d, the 24th, the 26th, the 29th, the 30th, the 31st, the 34th, the 37th, the 38th, and the 40th cases, or 10 cases out of 24, had chills on the third day.

Of these, one died, viz., Mary B., single, æt. 22, primip., confined Nov. 27th, and attacked with pelvic peritonitis the following day. The case terminated fatally Dec. 25th, probably from rupture of abscess into peritoneal cavity.

CASE 38. Lizzie Stern, single, æt. 19, primip., possesses special interest, as a year later she died suddenly from shock, a short time after confinement, in the boat-house, at the foot of East 26th street, where she had been carried *en route* to the obstetrical service of Charity Hospital.

CASE 39. Katie G., single, æt. 18, primip., was delivered by forceps, Nov. 29th, after a painful labor lasting fifty-four hours, and died on the fourth day from exhaustion.

On the first of December Fannie G., married, æt. 28, primip., had a labor, of which the first stage lasted ten hours, the second stage, five hours and fifty minutes. During the long second stage febrile symptoms were developed, and it was thought best to terminate the labor by means of forceps. The child weighed 9 pounds 2 ounces. The forceps' delivery was unattended by difficulty. As the febrile disturbance continued after delivery, it was thought best to remove the patient immediately to a medical ward. On the third day the pulse reached 140, R. 28, T. 104½°. During her subsequent illness, which terminated fatally on the 2d day of January, the patient made no complaint, except toward the end, of either pain, tenderness, or headache. The temperature ranged from 102° to 105°. During the last hours of her illness it ran up to 107°. However, under the influence of sponging, quinine, alcohol, and tinct. of gelseminum, the temperature frequently reached a nearly normal point. Thus on Dec. 12th, it was 99°; on the 13th, 99°; on the 14th, 99°; the 17th, 100°; the 18th, 100°; the 21st, 98½°; the 22d, 100°; the 25th, 100°; the 27th, 100°; the 29th, 99½°. But even on the most favorable days the evening exacerbations ranged between 103° and 105°. The pulse was for the most part persistently rapid, only twice (on the 17th and 21st) sinking be-

low 100 (viz., 96 and 92). The ordinary range was between 116 and 144, becoming 160 toward the end. For the most part of the time the patient said she "felt splendid." The vaginal discharge was not offensive. A slight laceration of the perineum became covered with grayish exudation, noted as cleaning up on the 22d, and as looking well on the 26th of Dec. The appetite was repeatedly reported excellent. Perspiration was always excessive. The sleep was generally disturbed at night by unpleasant dreams. Active delirium set in on the 29th of Dec. The bowels were moderately tympanitic. Slight pain was elicited by pressure of the fundus uteri. During the last two weeks of life chills occurred nearly every day. Pain and swelling of the joints, especially in the left shoulder, now occurred. Phlegmasia dolens was developed in the left leg Dec. 29th. On Jan. 2d, P. 160, R. 30, T. 107, mouth sore, tongue red and tremulous, subsultus tendinum, sighing respiration, face yellow, breath sweetish. Patient finally became unconscious, and death followed. There was no autopsy, but the case may be fairly set down as one of metrophlebitis, followed by purulent infection.

The fact that Fannie G. was transferred directly after confinement to a medical ward, and did not enter the puerperal wards at all, together with the fact that her fever came on prior to delivery, is evidence that the infection must have been derived either from the nurses, the physicians in attendance, the *armamentaria* employed, the beds used for confinement, or the condition of the confinement ward itself. Of course the long second stage rendered her peculiarly vulnerable to any existing pernicious influences. Some light, perhaps, may be obtained regarding these points from subsequent occurrences.

From the 2d to the 6th of December, inclusive, seven patients were confined. Of these all except one had a chill, and more or less pain and tenderness on the third or fourth day. In each case the uterus was noted as large, and the discharge as offensive. Six of the seven, however, made rapid recoveries.

In the seventh case, Agnes C., single, æt. 25, second preg., confined Dec. 6th, the record of the fourth day showed, pulse 132, resp. 28, temp. 104½°. On the tenth day there was muttering delirium, the eyes were sunken, the pulse 150, R. 33, T. 102½. On the eleventh day death took place, and the autopsy

showed the usual lesions of puerperal peritonitis. Was there any reason why this case should have proved fatal, not common to those already mentioned as having recovered? There is this comment in the history book: "Patient worrying greatly at giving birth to a second illegitimate child. Crying all the time." It is puerile folly to deny to mental emotions a prominent place among the causes of puerperal disorders.

On the 8th inst. it was determined once more to close up the confinement ward and shift the patients to another locality.

The first effect was happy. Of five cases confined four had not a single bad symptom. The other, the third in point of time (Dec. 8th), was violently agitated the second day after her confinement by the screams of a patient brought into the hospital from the street in the last stages of labor. From a perfectly normal condition her pulse became 148, the resp. 40, the temp. 105°. The febrile disturbance was maintained for two days following, and then subsided. How far this disturbance was due to moral causes it is impossible to say. A patient, confined the following day in the pavilion outside the hospital, where she was conveyed *en route* to the Charity Hospital because of the sudden intervention of labor, presented a parallel history, though the medical attendant, the nurses, and the locality were at that time all free from the slightest suspicion of taint.

A patient confined in Dec. 10th, died on the fifth day following of phthisis. So far, then, it was by no means clear whether simply a change of wards, but with a continuance of the same physicians and nurses, had had any special practical effect in the way of improving the service. On Dec. 12th, however, the answer came. Bridget Brophy, single, æt. 36, primip., had a long severe labor. The stage previous to the rupture of the membranes lasted fourteen hrs. forty-five m. The subsequent stage continued twelve hours, during the last six of which the patient seemed greatly exhausted. Finally she was delivered by forceps. The operation proved simple enough, but symptoms of shock ensued. The next day the pulse was 150, the resp. 32, the temp. 102°. The uterus was relaxed. In the afternoon, in consequence of the free administration of stimulants, the storm subsided. On the 15th inst., though her temperature was 99° only, and the patient said she "felt splendid," she was trans-

ferred to a medical ward on account of the offensiveness of the lochia. On the 17th she became delirious, the respirations irregular, the pulse feeble, the breath sweetish, the discharges continuing very offensive. A large diphtheritic patch, three inches in diameter, was discovered at the same time, covering the entire posterior wall of the vagina. On the 23d inst. she died, with the symptoms of intense septicæmia. Thus it was seen that a mischievous element had been imported into the freshly opened ward, which had only needed a sufficiently severe case of labor to assert its influence. During the time that elapsed between the 12th and the 19th inst. there were ten cases of confinement, of which six had more or less febrile disturbance, while four escaped unscathed.

On the 19th of December the service passed into the charge of Dr. I. E. Taylor, who at once restored the patients to the ward which had been closed by my order on the 8th of December. During the remainder of the month following the transfer, there were twenty confinements. Of these eight manifested disturbance of greater or less severity. Ten cases are reported to have done well, and in two instances no record is given. Thus far, then, it will be seen that no special results were obtained by exchanging one set of wards for another.

It is proper, perhaps, here to observe that many of the cases marked as manifesting a febrile reaction did not differ materially from a class of cases common enough in private practice, where the brevity of the attack frees the physician from serious apprehension. But when an aggregation of such cases occur in hospital practice, they are like the mutterings in the clouds which betoken the impending storm.

According to a hospital rule, two *internes* of the house staff were selected in order, and allowed the privilege of attending the labor cases of the obstetric service for one month. The beginning of each month, therefore, witnessed a change in the physicians. This change, taking place on the 1st of January, enables us to narrow down still further the sources by which the contagion was spread. Changing wards, it has been observed, did no good. Let us see whether with a change of physicians the patient fared any better.

The first two patients in January had no questionable symptoms. In the next case, however, the temperature rose on the

third day to 103°. On the fifth day the fever fell. On January 17th the patient was allowed to sit up. On January 21st she complained of abdominal pain, and of not feeling well. The next day the patient was pale, weak, and anæmic. The face looked pinched and emaciated, the eyes lost their lustre, the abdomen became tympanitic, and by 9.30 A.M. the register showed P. 160, R. 36, T. 100½°. In the afternoon the pulse was jerky and almost imperceptible, the extremities were cold and clammy, while at the same time the patient professed to feel very comfortable. At 10 P.M. she died. At the autopsy the abdomen was found filled with sero-purulent fluid, while lymph glued together intestines, liver, omentum, uterus, the abdominal and parietal walls. The uterus was 6½ inches long. That the peritonitis should have been so far overlooked in this case as to have led to the extension of permission to the patient to sit up on the 17th inst. is not a little singular. The evidences of adhesive inflammation within the abdominal cavity certainly show that the trouble must have existed long prior to the 21st inst., when the alarming symptoms were first noticed. The latency of the symptoms up to this point make the case a very remarkable one.

The fourth patient, who was delivered on the 6th of January, had moderate febrile disturbance on the fifth, sixth, and seventh days following confinement. She was discharged from the hospital on the 24th, but returned Feb. 2d, to be treated for subinvolution of the uterus.

The fifth patient, delivered Jan. 6th, had a short labor of three hours. Everything went on well, apparently, until the 13th inst, when slight abdominal pain was complained of, and the temperature rose to 103¼°. On the 15th inst. the temperature fell to 98¾°. Vomiting came on. The pulse, however, did not fall below 116. On the 17th the patient was weak, collapsed, and cyanosed. The pulse became imperceptible, and in the afternoon the patient died. In this case the temperature alone afforded no clue to the severity of the attack. Yet the post-mortem examination showed the peritoneum to be filled with purulent fluid and lymph. There had existed, likewise, pericarditis and pleuritis, limited to the lower surface of the lungs and the corresponding part of diaphragm. The uterus and vagina were normal. In this instance the morbific element,

whatever might have been its nature or origin, evidently was disseminated by the lymphatics through the system.

Susan M., single, æt. 22, primip., confined on same day as foregoing (Jan. 6th), had a chill come on during labor. The placenta was retained, and was removed by myself two hours after the birth of the child, as I happened at the time to be accidentally in the hospital, though not on duty. The delivery of the placenta was accomplished by the introduction of two fingers into the cervix. This patient died Jan. 12th, with all the symptoms of general peritonitis.

The three following cases (viz., the 7th, 8th, and 9th, consecutively) all had fever, pain, and abdominal tenderness, though all recovered.

Thus it will be seen that the change in the physicians wrought no miraculous transformation in the sanitary aspects of the service.

During the remainder of the month there were sixteen confinements, of which eight had, in various degrees, febrile and pelvic disturbances, and eight completed the period of convalescence without a single abnormal incident. For this slightly improved condition of affairs I think we must look in part to the reduced number of confinements during the month (there were forty-six in December and twenty-five in January), and partly to efforts to promptly remove fever cases from the wards so soon as the first symptoms of trouble were developed. It might be well here to state, in anticipation, that, in my opinion, the transmission of the disease from patient to patient was mainly accomplished through the agency of the nurses. It was to have been expected, therefore, that a diminution in the number of patients confined, and the removal of those infected, would lessen, while it would not entirely destroy, the capacity of the nurses for evil.

The first patient confined in February had moderate fever on the fifth, sixth, and seventh days. The second patient did perfectly well. The third patient, however, a married primipara, 37 years of age, confined Feb. 5th, had on the afternoon of the second day the following record: R. 24, P. 112, T. 103°. By Feb. 8th the abdomen had become tympanitic and tender, there was thirst and anorexia, the tongue and lips were dry, and directions were given to remove her to the third medical divi-

sion. Feb. 10th the patient was delirious. Feb. 12th, R. 44, P. 156, T. 101¾°, face livid, failing pulse, and death at noon.

The volcano had been for a time quiescent, but was not yet extinct.

The fourth, fifth and sixth patients all did well. The seventh patient had fever on third day, subsiding on the sixth day, and returning once more on tenth and eleventh day.

The eighth patient, Sarah L., single, æt. 19, primip., delivered Feb. 11th of a premature child, after a labor lasting nineteen hours, twenty minutes. On the third day developed abdominal tenderness, on the sixth day was delirious, with dry tongue, insomnia, blue lines about eyes, flatus, involuntary passage of urine, and great tenderness over right inguinal region. Notwithstanding the severity of the symptoms, she passed a quiet night and awoke in the morning convalescent. She was discharged well, March 12th. There was no apparent reason for this exceptionally severe attack, except that from the outset "she was very despondent, shedding tears when spoken to."

CASE 9 had chill, abdominal tenderness and fever (104°) on third day, but no further trouble.

CASE 10. Mary R., single, æt. 17, primip., confined Feb. 13th. Previous to delivery had œdema of legs, and labia externa, but no albumen in urine. There was post-partum hemorrhage, and the placenta was extracted manually. She was transferred immediately after confinement to Med. Ward No. 24. The lochia became offensive, a diphtheritic ovoid ulcer appeared on each labium on third day, fever set in, but the patient eventually recovered.

CASE 11 had cellulitis.

CASE 12 made a good recovery.

CASE 13 had an attack of cellulitis, which kept her in bed until April 21st.

CASE 14. Nellie M., married, æt. 21, third pregnancy, confined Feb. 20th, had a perfectly normal labor; died sixty hours after confinement, with symptoms of intense septicæmia.

CASE 15 had an attack of cellulitus, which kept her in bed until May 1st.

CASE 16 had pneumonia, but no pelvic symptoms.

CASE 17 had no trouble.

CASE 18 had fever on the third, fourth, and fifth days.

Case 19 had febrile symptoms of sufficient severity to lead to her transfer on the fourth day to a medical ward.

Cases 20 and 21 had each moderate febrile disturbance for two or three days after confinement.

Case 22 had œdema pulmonum, as a complication of general anasarca. The patient had no puerperal symptoms, and recovered in a month's time.

Cases 23 and 24 both did very well.

Case 25. Mary C., married, æt. 28, fifth pregnancy, confined after a long labor (twenty-three hours), Feb. 23d; had a high temperature the following day, profuse fetid lochia, and great nervous prostration. These symptoms subsided in two weeks, but on March 10th the patient had a severe chill, followed by a temperature of 105°. A second chill followed the succeeding day. On the 14th inst. pneumonia developed, and on the 15th the patient died. The autopsy revealed decomposing pus in the sinuses of the uterus and around the ovarian veins, peripheral abscesses, pyelonephritis, and pyæmic (gangrenous) abscesses in the lungs. There were no peritoneal symptoms in life, nor any lesions of the peritoneum found after death. The patient had primarily puerperal phlebitis, followed by metastatic abscesses.

During February there were twenty-five confinements. Three patients died. Twelve had more or less febrile disturbance. One had pneumonia, one œdema pulmonum, and eight had no abnormal symptoms.

Thus, during the months of January and February, out of fifty patients confined, there were six deaths, and only twenty-four of the entire number escaped without febrile symptoms of more or less severity.

From Feb. 23d to March 1st there were, fortunately, no confinements. On the 1st of March I resumed my duties as attending physician to the Obstetrical Department. It soon became apparent that the sanitary condition of the service had passed into a new stage of development. Whereas, heretofore, the change of the patients to a healthy part of the hospital had accomplished but little in the way of preventing the continuance of febrile outbreaks, the attacks came on three or four days after delivery, and were probably due to the neglect of ordinary precautions on the part of ignorant and irresponsible nurses. But by this time the aggregation, for a period of

ten weeks, of infected patients in the same locality, had poisoned the wards themselves. This was evidenced by a prolongation in the duration of labor, the frequency of post-partum hemorrhage, and the great difficulty of getting the uterus to contract after parturition had been completed; that is to say, an abnormal performance of a whole series of acts which were completed prior to the period when the patients naturally fell to the charge of the nurses. It would in all likelihood have been well to have, at this time, once more removed the patients to a healthy locality, but this was, owing to the overcrowded condition of the hospital, an impossibility. During the month of March it will be seen that, while the aggregate amount of sickness was great, the death-rate was small; a result in large measure due to the untiring exertions of the *internes* in charge.

In the first two cases there was very mild febrile movement. Case 3 had pelvic cellulitis and phlegmasia, but recovered.

CASE 4. Mary S., married, æt. 27, primip., confined March 3d, had a long labor, lasting forty-eight hrs. Following the delivery of the placenta there was considerable post-partum hemorrhage. The following day the uterus was still soft, and the fundus reached as high as the umbilicus. Pain and tenderness were complained of in the right leg, and were followed by swelling, and finally by the development of phlegmasia in both extremities. By the 20th inst. the pain and swelling were mostly confined to the right trochanter. As fluctuation was detected the patient was transferred to Med. Ward 18, with directions to make a free incision to let out the pus. Upwards of three pints of fluid were evacuated. The patient eventually succumbed to the protracted suppuration which followed. The *autopsy* revealed nothing to account for the lesion. The veins were pervious and healthy. There were no traces of pelvic cellulitis or peritonitis. The uterus was small, and normal in appearance. The lymphatics were unaffected. Whatever the process may have been which led to the phlegmasia, it left nothing behind to stamp its character.

CASE 5 had no trouble except that the uterus did not contract down well.

CASE 6 had no trouble.

Case 7 had a slight attack of cellulitis, but made a good recovery.

Case 8. Kate M., married, æt. 21, second preg., confined March 7th, had post-partum hemorrhage. A recurrence of hemorrhage took place March 12th, when the uterus was found distended by clots and reaching to the umbilicus. A half-basinful of clots were removed from the vagina and uterus by hand. The patient, however, was discharged well April 2d.

Case 9 had some pain on third day, with profuse lochia, slight fever, and some diarrhœa. Her condition was aggravated by the fact of her fretting greatly over the loss of her baby, which she gave away for adoption.

Case 10. Julia P., single, æt. 20, primip., confined March 8th, was of unusual interest. Two years previously she had had syphilitic sores upon the inner surface of the labia, for which she had been treated at Charity Hospital. On admission a hard syphilitic indentation was found, involving the labia, perineum, and lower part of the vagina. The inguinal glands were enlarged, and there was a worm-eaten ulcer on the right leg. The first stage of labor lasted twenty-nine hrs., the second stage seven hrs. thirty m., when I delivered the child with forceps, rupturing to some extent the indurated perineum. There was some post-partum hemorrhage. On the day following, on making the afternoon visit, I found the respirations 40, the pulse 168, and the temperature 104°. There was pain in the abdomen, the patient was delirious, and on examination a large diphtheritic patch was found on the vulva. This I ordered to be cauterized with āā tinct. iodi comp. and liq. fer. persulph. The next day the more serious symptoms subsided. The ulcer gradually cleaned up and the patient recovered. Curiously enough, in one little point not reached by the caustic, a hole was eaten completely through the labium internum.

From this time onward diphtheritic ulcers in the genital passage became a feature common to nearly all the cases seriously affected. Following the patients in the order of confinement, these patches were found in Cases 11, 12, 14, and 15. In Cases 13, 16, and 17 the diphtheritic appearances were not observed, but in them all it was nearly impossible to procure contraction of the uterus. In Case 16, sixteen grains of ergotine were injected hypodermically before any effect was produced. In Case 17

ice alone produced any effect, pressure and ergotine failing completely.

In a report made to me by Dr. J. L. Perry, House Physician, and Dr. Robt. A. Murray, Senior Assistant, who were indefatigable in the performance of their duties during the month's service, they state regarding these and similar cases which occured:

"We have often held the uterus for several hours, and in one case Dr. Perry was obliged to hold the uterus all night. Otherwise the uterus would rise above the umbilicus, and hemorrhage would occur. Dr. Perry found Squibb's ergot so powerless, even in ℥ ss. doses, that he almost abandoned its use. Quinine, on the contrary, appeared to possess a marked efficacy.

CASE 18. Bridget B., single, æt. 28, second pregnancy, confined March 16th, presented some want of uterine contraction, and a few hours after confinement had a flushed face, dry tongue, sordes in the mouth, and a tympanitic abdomen. The next day a diphtheritic patch appeared on the posterior commissure, and the lochia became offensive. Three convulsions occurred on the 19th inst., and the patient became comatose. At 2 o'clock A.M. on the 20th, another convulsion occurred, and the patient died. At the autopsy the liver and spleen were found soft and congested; there was no peritonitis, but the internal surface of the uterus was coated with grayish diphtheritic sloughs, the inner surface of the uterus was torn and gangrenous, and large gangrenous patches coated the inner surface of the vagina. It was specially noted in this patient that she was, prior to, and following her confinement, the victim of intense terror for fear lest something should befall her.

CASE 19 had flaccidity of the uterus.

CASE 20 had moderate fever lasting three days.

CASE 21 had albuminous urine with granular casts, œdema of the labia, and convulsions following delivery. Three days later diphtheritic patches appeared on the right labium. By April 1st patient was convalescent, and sitting up.

There were thirty-six patients in all confined during March. Of the cases from No. 22 to 36, six had no trouble. In three cases the disturbance was very slight. In one case diphtheritic trouble was developed, and in the remaining four the principal features were profuse lochia, abdominal tenderness, sweating, chills, and

oftentimes retention of urine. They seemed to be mild cases of cellulitis and pelvic peritonitis, terminating in recovery after no very long period of time. One of these latter was a patient confined in a police station-house, and afterward brought to the hospital by ambulance. It was noticeable in her case that the serious symptoms, instead of breaking out upon the second or third day, were delayed until the ninth day after delivery. Thus of the women delivered during March, there were two deaths, one from phlegmasia and one from diphtheritic conditions of the genital organs.

During this month too high praise cannot be awarded to the untiring zeal and fidelity of Drs. Perry and Murray. So soon as premonitory symptoms were observed, such as a flushed face, a headache, a slight chill, a change in the lochia, pain in the abdomen, everything was done to anticipate the threatening storm. Where patches appeared upon the vulva, quinine was given in from ten to twenty grs. per dose. The patients were syringed every three hours with carbolized water. Drs. Perry and Murray state: "Every patient had her own catheter and syringe, which were put in carbolic acid after being used. No sponges were allowed. The patches were touched with a mixture of iodine and persulphate of iron. To be sure that the patients were properly cared for, all those who had high temperatures, tender abdomen, or lacerations, were cleaned, syringed, and had their urine drawn by ourselves. We likewise administered the medicines, as it was impossible to confide these important matters to ignorant and irresponsible nurses. The wards were visited night and day every two or three hours by one or both of us, and for most part of the time one of us remained constantly in the ward. Bed and bedding were changed either by our own hands or in our presence, to be sure that the patient was comfortable. . . . . All rags used were destroyed. Nothing used on one patient was employed upon a second, if possible. As far as could be, new cases were put in fresh, clean beds. So many critical cases soiled a great deal of linen, and the amounts which were found ordinarily sufficient proved inadequate for the emergency. Napkins and blankets therefore gave out, and for a little while blankets which had been used over cases with high temperatures had to be used for new cases. The warden, Mr. Brennan, and the matron,

Mrs. Riddle, however, speedily furnished a new supply of napkins and blankets. . . . .

"When the puerperal cases were at their worst, only one of us attended them, while the other attended the confinements. Our hands were washed in carbolic acid and glycerine, or Labarraque's solution, before going from one infected case to another, and before confining any case. Carbolic acid was sprinkled over the floor. The patients were warmly covered, and the windows let down several inches. . . . We constantly felt that there were too many patients in each ward. Patients with high temperatures were often in the ward into which a freshly confined case had to be brought, though we made it a point to send out all such cases when it was possible to procure places for them. The severer cases were transferred to the medical divisions. Had there been only four to six cases to each ward, our nurses could have taken much better care of them. . . . Owing to one of the nurses going away and becoming intoxicated, one of the wards was left for about ten days without a second nurse. The remaining one was civil and obliging, but had no memory or care. One of the waiting women had to be brought up to assist this nurse. The duties of the nurses were numerous, and no one could care for from twelve to sixteen beds when full, as was the case sometimes during the month. Sometimes six confinements took place in one day, and the amount of old rags, linen, and blankets needed was considerable, and even with the utmost economy a sudden demand would completely exhaust the supply."

Thus we have vividly presented to us a not exaggerated picture of the inadequacy of the provisions made for the obstetrical service of the Bellevue Hospital. It is important to dwell upon this subject. Such conditions ought never to exist again in any civilized community. It is cheap talk to blame the "tainted hospital," but by similar management it would have been possible to have made a pesthouse of the garden of Eden. It would be useless to ascribe the state of affairs to any particular individuals. The whole arrangement was radically wrong and vicious from the beginning. Any one familiar with hospital affairs is aware of the serious drain upon the pecuniary resources of an institution which results from small leakages. Where appropriations are limited, a wise economy cannot

afford to overlook losses liable to be thus incurred. For this reason everything had to be kept upon a peace, instead of a war footing. Thus space, ventilation, nursing, blankets, napkins, and all the armament in use, were amply sufficient for all ordinary emergencies. In times of peril, when new wants were suddenly created, the deficiencies became miserably apparent.

Three wards were assigned to lying-in patients. These contained an aggregate of 75,120 cubic feet of air. The average number of patients at one time in the wards was upwards of thirty-two, which would give about 2,348 cubic feet of space to each patient. The French system was adopted in the arrangement of the service. The first room was fitted up with *lits de misère*, beds upon which the patients were confined. Here the bedding was frequently changed, but the bedsteads never. After confinement the women were transferred to the adjoining room, where they remained for from four to five days. They were then transferred to the second ward, where they were kept until they were able to sit up. Finally they passed into the third ward, in which they continued until strong enough to be discharged. Now it is well known that nearly all puerperal troubles occur during the first five days after delivery. Past this period puerperal inflammations are rare. The granulation of wounds affords a barrier to the absorption of septic materials. The reduction of the uterus offers a safeguard against the dreaded affections of the veins and lymphatics. Common-sense policy would dictate, therefore, not the aggregation of the newly confined into one apartment, but either complete isolation, or their distribution among patients not liable to contamination. This is recommendable, not only on account of the vulnerability of the newly confined, but for the same reason that it is thought desirable to isolate or dilute the influence of surgical cases with open wounds.

The opposite policy prevailed at the Bellevue Hospital. The room assigned to fresh cases contained 15,970 cubic feet of space. The number of occupants averaged from six to eight. In the winter months, when the ventilation was imperfect, it was always merely a question of time as to when the sanguineous and purulent discharges of these patients would load the atmosphere with morbific elements to such a degree

as to exercise a deleterious influence. In this ward all puerperal disorders invariably had their origin. It was the rule, when a case of fever occurred, to transfer it at once to the medical side. In spite of this precaution a winter rarely passed without its becoming necessary to close the ward for a time, and subject it to thorough disinfection. During the panic of 1873–4 there were in this city large numbers of unemployed poor. As a consequence the hospital was overcrowded, and the transfer of obstetric cases to the medical wards became a matter of difficulty. In the interests of economy it was made the duty of the midwife attending cases of labor to likewise syringe and care for the patients in the adjoining room. Yet it is hardly possible to conceive of a more ingenious arrangement for keeping alive disease, when once generated, than this. A patient with fetid discharges is syringed out by the midwife, who perhaps a few moments after is called upon to cleanse the genitalia of a patient just confined. During the month of March the house physicians themselves did much of this sort of work, because of the difficulty of getting their injunctions carried out by others. They strove, however, to protect themselves from acting as carriers of contagion by incessant and thorough ablutions with disinfecting fluids. As bearing upon the question of the portability of the puerperal poisons, it is interesting to note that, while during the entire epidemic I spent upwards of one to two hours daily in the hospital, I had not a single bad symptom developed among patients whom I attended in private practice.

It is interesting here to inquire whether it was possible at this time to control the mischievous influences at work in the hospital. The following facts speak for themselves: From April 1, 1873, to April 1, 1874, 434 women were confined. Of these 23 died. Eight of these fatal cases were due to causes in no way referable to the condition of the hospital (pneumonia, phthisis, cerebral embolism, uræmia, etc.), leaving 15 cases of metria, or about 3.7 per cent. Now let us compare the Bellevue Hospital with the Lying-in Institution in Dresden for the years 1872-3. In the year 1872 there were in the latter 991 confinements and 52 deaths, a rate somewhat exceeding 5 per cent. During the first nine months the death-rate was 6.5 per cent., whereas it fell in the succeeding three months to 2.8

per cent. This favorable change was not due to the workings of a special grace, but to the energetic measures inaugurated by Winckel, who assumed the control in October, 1872. These measures were in substance as follows: The locality of the confinement ward was changed. Every patient was continued upon the bed in which she was confined. When removed to an adjoining ward the bed was transported with her. Each ward containing puerperal patients was emptied once a year in turn, and kept vacant for from three to four weeks. A distant wing of the hospital was set apart for erysipelatous or other cases requiring to be separated from those who were in a normal state. An additional nurse relieved the midwife in attendance upon confinement cases from all charge of the puerperal patients. To determine the carriers of infection only one female pupil at a time was allowed to take charge of the confinements. So soon as a single case of fever occurred among the patients delivered by her, she was at once prevented from examining either pregnant or parturient women. Similar regulations were enforced in the case of the medical attendants.

In the year 1873 the month of January began badly. From the 1st to the 9th, inclusive, 26 patients were confined. All, without exception, were taken ill, and five, or 19 per cent., died. This formidable state of affairs was coincident with a change in the staff of nurses. Whereupon the following additional orders were issued: Examinations of parturient women to be forbidden to all those who had previously been in the habit of making them. Removal of the midwife in charge of the labor cases. The pupils and midwives were forbidden to wash the genitalia of the puerperal women, but the latter were compelled to perform their own ablutions. All the instruments and apparatus in the lying-in ward were either destroyed or subjected to white heat. Each patient was provided with her own catheter and injection tube. Temperatures were taken in the axilla, in place of the vagina. The ulcerations about the vulva and vagina were touched with the liq. fer. perchlorid. This duty was performed by Winckel himself. As a result of the enforcement of these rules, from the 10th of January to the 7th of July, out of 510 births there were but three deaths. But of these three, one was due to rupture of the uterus, one to nephri-

tis, and one only, or 0.2 per cent., took place from metria, a result scarcely possible in a similar number of confinements among the poorer classes in their homes. In the months of August and September six patients died. At the end of October and the beginning of November four died. In both these small epidemics the communication of the disease was traced directly to the midwives in charge. They ceased the moment the removal of the latter was secured. The year 1873 witnessed 1,011 confinements, and 18 deaths from metria, or 1.8 per cent.

In referring to the reforms introduced into the hospital management, Winckel states: "Although these changes increased the annual expenditures, not hundreds, but thousands of dollars, they were at once allowed without red tape (ohne Umstände), and in the shortest possible time, by the Royal Department of Internal Affairs." A request under similar circumstances for an addition to the force of nurses at Bellevue Hospital, with increase of pay, and consequent improvement in the quality, was refused. Is it too much to hope, that a time may yet come, when an intelligent regard for great trusts may likewise govern the actions of those, who administer the "government of the people, by the people, for the people"?

However, relief was promised from another source. The State Charities' Aid Association offered to supply the Lying-in Department with competent workers from the "Training School for Nurses," which was an outgrowth from their organization. This offer I would gladly have accepted. Unfortunately, however, a dispute arose between the members of the Medical Board and the managers of the Training School, regarding certain points of jurisdiction. As a result of this controversy the acceptance of the offer made by the State Aid Association was delayed until the 1st of May. Meantime a rumor of coming changes reached the ears of the nurses at the time on duty. The most complete demoralization at once ensued. The small sense of responsibility which had previously adhered to them now departed. The tables furnished for April show the further development of the pestilence.

Out of 35 cases confined there were 27 cases of puerperal disease and 9 deaths, leaving thus 8 cases only which present-

Number.	Date.	Age.	Social Condition.	Number of Pregnancy	Duration of Labor.		Character of Labor.	Diseases.	REMARKS.
					First Stage (hours).	Second Stage (hours).			
1	1st	28	M.	3	.....	.....	.....	Cellulitis.	MARY Y——. Disease terminated by abscess formation, which discharged through Douglas's cul-de-sac into vagina, April 27th, whose symptoms were at once relieved.
2	1st	20	S.	1	.....	.....	.....	Cellulitis.	JESSIE S——. Cellulitis of mild type. Patient discharged well, April 27th.
3	3d	22	M.	1	47	2	.....	Slight endometritis.	KATE M——. Up April 10th.
4	4th	32	M.	3	.....	.....	.....	Pelvic peritonitis.	MARGARET C——. Chill second day. Severe pelvic peritonitis, with formation of pelvic tumor in right iliac fossa. Phlebitis of right leg.
7	6th	28	S.	1	30	5	.....	Slight cellulitis.	ELIZA MC——. Patient was sitting up on tenth day.
13	8th	20	S.	1	.....	.....	.....	Diphtheritis of vulva.	EMMA R——. Up on the 19th of April. Treated with tinct. iodini co. and liq. ferri persulph.
16	12th	23	S.	1	.....	.....	Forceps.	Diphtheritis of vulva.	CHRISTINI A——. Second day R. 44, P.144, T. 105° Fahr. No pain nor abdominal tenderness. Recovery under local treatment.
17	13th	27	Wid	1	.....	.....	.....	Cellulitis and pulmonary embolism.	CHRISTINA O——. Discharged well April 30th.
19	14th	40	M.	7	.....	.....	.....	Puerperal rheumatism.	SARAH D——. Symptoms of cellulitis, beginning with chill on the third day. Up April 27th.
22	15th	22	S.	2	55	30	.....	Bright's disease.	MARY R——. The kidney affection complicated pregnancy, which it antedated; no convulsions.
23	15th	33	M.	4	$5\frac{35}{60}$	5	.....	Diphtheritis of vulva.	MARY M——. Offensive lochia. Albuminous urine. Discharged well May 10th.
25	19th	25	S.	2	$\frac{33}{60}$	$\frac{44}{60}$	.....	Slight cellulitis.	ANNIE T——.
27	23d	25	M.	1	$7\frac{10}{60}$	$2\frac{25}{60}$	.....	Diphtheritis of vulva.	SARAH C——. Septic symptoms. Local treatment. Verat. viride, quinine, whiskey.
30	26th	24	S.	1	$15\frac{30}{60}$	$\frac{15}{60}$	.....	Cellulitis.	ALICE U——. Discharged May 27th.
33	28th	22	S.	1	.....	.....	.....	Diphtheritic patch on vulva.	MARY S——. Long septic fever, terminating in recovery.
34	30th	24	M.	2	.....	.....	.....	Cellulitis.	MARY P——. Hour-glass contraction.
35	30th	34	M.	4	.....	.....	.....	Mild septic fever.	BRIDGET H——.

ed no unfavorable symptoms[1] (Nos. 6, 8, 9, 10, 12, 15, 20, 26). On the 1st of May the managers of the Training School were invited to take charge of the nursing of the Lying-in Ward. Up to this time the obstetrical service occupied the upper story of one wing of the hospital. It was now removed, on suggestion of Warden Brennan, to the story immediately below, which had always enjoyed an excellent sanitary reputation. It should, however, be stated, that this floor, like all the other Medical Divisions of the hospital, had received during the epidemic, a number of cases of puerperal fever. A lazaretto was established in a remote part of the hospital for the reception of cases who manifested symptoms of a threatening character. It was expected at the time of this removal that the nursing would pass at once into the hands of the probationers of the Training School. Unfortunately, however, the managers of the Training School were not prepared to assume at once full charge, on account of the deficiency in the numbers of the pupils under their control. Their arrangements were not completed until the 20th of May. Two nurses were, however, detailed from the force on the 1st of May, to aid, so far as lay in their power, in the performance of the very onerous duties of the department. But even this inadequate change was not without some beneficial result. Thirty-five cases were confined during the month. There were 17 cases of disease, with 10 deaths.

But there were eighteen patients who had no bad symptoms, whereas in the previous month, with the same number of confinements, only eight had a similar good fortune. It is surely not at all impossible that, could a complete change in the attendants have been made on the 1st of May, a continuance of these disasters might have been averted.

In a Report made by me to the Committee of Inspection of the Hospital in the early part of June, I furnished the following statement of the measures adopted, under my direction, with a view to checking the epidemic: "The wards have been changed; a lavish use of carbolic acid and Labarraque's solution enjoined; oakum, as recommended by Dr. Goodell, has

[1] Regarding the fate of one patient, Lizzie F., æt. 24, single, primip., I have been unable to obtain definite information. She had an attack of peritonitis, was very ill, but I find nowhere any record of her death.

Number.	Date.	Age.	Social Condition.	Number of Pregnancy.	Duration of Labor.		Character of Labor.	Causes of Death.	REMARKS.
					First Stage (hours).	Second Stage (hours).			
5	4th	25	S.	2	10	$7\frac{50}{60}$	Forceps.	Peritonitis.	JULIA S——. Peritonitis developed second day. Death took place on the 8th inst. (fourth day). *Autopsy:* Decomposed membranes in uterus. Usual post-mortem appearances of peritonitis in the abdomen.
11	7th	16	S.	1	.....	.....	.....	Peritonitis.	MARY L——. Chill on second day. Repeated chills. *Autopsy:* Uterine phlebitis. Pus in cellular tissue about uterus. Pus in ovaries. Ovaries size of pigeon's eggs. Thrombus in ovarian veins.
14	12th	20	M.	1	$28\frac{30}{60}$	$2\frac{10}{60}$	.....	Peritonitis.	ANNIE S——. Developed on second day. Died April 21st.
18	13th	19	M.	1	$25\frac{15}{60}$	$\frac{10}{60}$	.....	.....	MARY J. R——. Transverse presentation. Delivered by one of the hospital internes. Died from exhaustion sixteen hours after.
21	14th	19	Wid.	1	.....	.....	.....	Peritonitis.	MARY MCE——. Chill on fourth day. Erysipelatous inflammation over right natis and hip on the 27th of April. Lochia very offensive and scanty.
24	15th	35	Wid.	5	$38\frac{55}{60}$	$\frac{5}{60}$	.....	Peritonitis.	KATE C——. Old rupture of perineum. Vulva gaping. Symptoms of intense septicæmia. *Autopsy* showed large flabby uterus, cervix lacerated, parametritis, endometritis, and peritonitis.
28	24th	31	M.	5	$7\frac{30}{60}$	$\frac{10}{60}$	.....	Peritonitis.	THERESA F——. Uterus large and flabby. Lochia scant and offensive. Died May 6th.
29	25th	28	M.	1	24	$5\frac{10}{60}$	.....	Peritonitis and diphtheritis of vulva.	ANNIE C——. Died April 30th. Both pleural cavities contained serum and fibrine. Kidneys white. Uterus and ovaries covered with purulent exudation.
32	27th	22	S.	2	$16\frac{20}{60}$	$\frac{15}{60}$	.....	Diphtheritic appearance of vulva, peritonitis.	MARY D——. Died April 29th. *Autopsy:* Uterus eight inches long. Pus in lymphatics of cervix and pelvic cellular tissue. Sero-purulent œdema. Lymph glands enlarged.

been substituted for napkins; in syringing, each patient has a glass tube assigned for individual use; the nurse in attendance during labor is not allowed in any way to come in contact with the recently confined; the windows are constantly kept widely open; and the physicians in charge are fully alive to the importance of promptly removing from their supervision any patient who presents symptoms in anywise suspicious." There was, however, one fatal defect, viz., with these precautions, a continuance of nurses who had attended infected cases.

I shall not attempt to enter into a special description of the character of the epidemic. This work has already been performed with great ability by Dr. Parry, of Philadelphia, who witnessed one presenting similar features in the Philadelphia Hospital.

The diphtheritic nature of the grayish deposit upon lacerations about the vulva and vagina is unquestionable. Dr. Steurer, who was my House Physician during the month of May, and is at present a pupil of Prof. von Recklinghausen, of Strasburg, writes that he, with the assistance of Prof. R., has since been working up the microscopical appearances of the deposit in an epidemic which has recently occurred in Strasburg. "We found it," he says, "a true diphtheria. Micrococci were found beneath the deposit, and scattered throughout the tissues of the uterus, whence they were taken up by the sinuses, and conveyed into the circulatory system. They may be found in the muscular structure of the vulva, and always occur in colonies. They are sometimes found in the blood-vessels of the kidney, distending whole glomeruli."

In my own experience prompt cauterization with strong carbolic acid, or the application of Churchill's tincture to the diphtheritic membrane, was often followed by a surprising amelioration of symptoms which had assumed an alarming character.

In the Report to which I have already alluded, I felt called upon to represent the necessity of at once breaking up the obstetric service of the hospital, and vacating the wards for the time being. This report received the endorsement of the Medical Board, and, in consequence, the closure took place by order of the Commissioners of Public Charities and Correction, on the 11th of June.

CASES IN *May* TERMINATING IN *Recovery*.—No 3.

Number.	Date.	Age.	Social Condition.	Number of Pregnancy.	Duration of Labor.		Character of Labor.	Diseases.	REMARKS.
					First Stage (hours).	Second Stage (hours).			
3	1st	30	M.	4	20	$\frac{5}{60}$	.....	Pelvic peritonitis.	MAGGIE MCR——. Pelvic peritonitis. Offensive discharges. Left hospital May 22d.
9	7th	25	M.	2	$3\frac{45}{60}$	$\frac{5}{60}$	.....	Moderate pelvic peritonitis.	BRIDGET S——. Patient epileptic. Well May 23d.
12	9th	18	M.	1	$18\frac{45}{60}$	$\frac{55}{60}$	.....	Diphtheria of vulva.	ALICE M——. Relaxation of uterus three-quarters of an hour after delivery. Ice employed. Diphtheritic condition of vulva. Local treatment and quinine.
18	13th	35	M.	8	7	$\frac{30}{60}$	.....	Pelvic abscess.	MARY MCG——. Uterus had to be held for five hours after delivery. Patient entered hospital three weeks previous to confinement with delirium tremens.
20	16th	26	S.	1	$4\frac{10}{60}$	$\frac{57}{60}$	.....	Diphtheria of vulva.	ELLEN O'D——. Uterus was large. Patient suffered much from cystitis.
25	19th	26	M.	1	$19\frac{30}{60}$	$1\frac{34}{60}$	.....	Diphtheria of vagina and vulva.	ELLEN S——.
28	25th	21	M.	1	$21\frac{35}{60}$	$2\frac{35}{60}$	.....	Diphtheria of vulva.	JENNIE S——. Uterus large and flabby.

CASES IN *May* TERMINATING IN *Death*.—No. 4.

Number.	Date.	Age.	Social Condition.	Number of Pregnancy.	Duration of Labor. First Stage (hours).	Duration of Labor. Second Stage (hours).	Character of Labor.	Causes of Death.	REMARKS.
1	1st	18	M.	1	12	$\frac{45}{60}$	.....	Peritonitis & septicæmia.	BELLA M——. Breech case. Chill on the second day. Delirious on the third day, and on the fourth day death.
4	2d	20	S.	1	$26\frac{25}{60}$	1	.....	.....	MARIAN WATERS.
10	8th	21	S.	1	$11\frac{25}{60}$	$\frac{10}{60}$	.....	.....	ANNIE SMITH.
14	11th	24	S.	2	.....	.....	Twins.	Peritonitis and diphtheritis of vulva.	ELLEN M——. Precipitate labor (first child born in water-closet; second child inside of thirty-five minutes from first labor pains). Uterus failed to contract. Ice, ergot, battery used for three hours. Twelve hours later hemorrhage recurred, and was stopped by pressure and ergot. On visiting the patient I drew from the bladder sixty-four ounces of urine.
21	17th	20	M.	1	$16\frac{30}{60}$	$1\frac{30}{60}$	.....	Diphtheria of vulva.	ANNIE M——. Attended a patient who died of puerperal fever. Felt badly ten days before confinement
22	18th	25	M.	2	5	$\frac{40}{60}$	.....	Diphtheria of vulva.	MAGGIE N——. Died May 22d.
29	26th	21	S.	1	$24\frac{30}{60}$	$4\frac{5}{60}$	.....	Diphtheria of vulva.	KATE M——. Relaxation of uterus. Uterus held for twenty-four hours after confinement.
30	26th	25		2	$27\frac{45}{60}$	$3\frac{5}{60}$	.....	Diphtheria of vulva.	MARY T——. Relaxation of uterus.
34	27th	19	S.	1	$6\frac{20}{60}$	$2\frac{5}{60}$	.....	Diphtheria of vulva.	JENNIE G. D——.
35	28th	38	Wid.	1	$5\frac{10}{60}$	$\frac{8}{60}$	.....	Peritonitis, lymphangitis, diphtheria.	CORNELIA S——. *Autopsy:* Uterus 9×5 inches. Cervix diphtheritic. Sinuses filled with soft thrombi. Pus in lymphatics, and enlargement of lymphatic glands.

Cases in *June* terminating in *Recovery*.—No. 5.

Number.	Date.	Age.	Social Condition.	Number of Pregnancy	Duration of Labor. First Stage (hours).	Duration of Labor. Second Stage (hours).	Character of Labor.	Diseases.	Remarks.
3	2d	20	S.	7	$8\frac{35}{60}$	$1\frac{10}{60}$	.....	Diphtheria of vulva and cervix uteri.	Ellen T——. Perineum ruptured to sphincter ani, became covered with diphtheritic coat. With speculum was discovered diphtheritic condition of cervix.
5	6th	28	M.	3	28	$1\frac{35}{60}$	Breach.	....	Maria D——. Extraction by Dr. Taylor. Mental worry. Delirium. Swelling of right arm. Hypogastric pain, fever, etc. Discharged July 22d.
7	8th	28	M.	1	44	$2\frac{15}{60}$	Forceps.	Diphtheritic condition of perineum.	Alice W——. Rupture of perineum (after removal of forceps), diphtheritic deposit on abraded surface. Abscess of forearm. Discharged July 23d.
9	11th	22	S.	1	17	$\frac{45}{60}$			

Cases in *June* terminating in *Death*.

Number.	Date.	Age.	Social Condition.	Number of Pregnancy	Duration of Labor. First Stage (hours).	Duration of Labor. Second Stage (hours).	Character of Labor.	Causes of Death.	Remarks.
1	1st	25	M.	2	6	$\frac{10}{60}$	.....	Metrophlebitis.	Alice de l'H——. Chill six hours after delivery. Uterus enlarged, five inches above pubis, and tender.
4	6th	25	M.	3	12	$\frac{20}{60}$	.....	.....	Eliza M——. Towards end swelling of right arm.
9	11th	22	S.	1	17	$\frac{45}{60}$	.....	Diphtheritic condition of parts.	Lena J——. Lateral incisions made into vulva during delivery of head. The wounded surfaces became covered on the third day with diphtheritic deposit. Patient died June 23d, and post-mortem examination revealed pus in the peritoneal cavity, in the uterine sinuses, and at the junction of the broad ligament with the uterus.
10	11th	23	M.	1	$21\frac{15}{60}$	2	.....	Metrophlebitis and peritonitis.	Nellie R——. June 17th, 9 A.M., P. 184, R. 32, T. $109\frac{1}{2}$° F. *Autopsy* showed uterus to be seven inches in length. Sinuses contained pus. Sero-purulent œdema of cellular tissue. Sero-pus in peritoneal cavity.

From the 1st to the 11th of June inclusive (Table 5) there were ten confinements with four deaths.

From the 1st of January to the 11th June, out of 166 patients confined there were thirty-one deaths.

A careful survey of all the facts recited seems to justify us in drawing two conclusions:

1st. That puerperal diseases may be engendered by the atmosphere alone. This is shown by the experience in September, 1873. Here febrile disturbances were developed among the patients of the ward, which at once subsided on removing them to another locality, though, in the new quarters, no changes were made either in the doctors, the nurses, nor in the utensils used. Nor was this an isolated experience. It owes its importance to the fact that the same thing had happened over and over again. The nature of the miasm can only be the subject of conjecture. The closure of the ward for the space of three or four weeks usually restored it to a healthy condition. The poisoned atmosphere invariably was generated in the ward set apart for the newly confined, and, as a rule, it rarely manifested any special virulence except during the winter months, when the ventilation became imperfect. At a time, when puerperal fever raged with greatest intensity, the deposit of diphtheritic membranes, characterized by colonies of micrococci, upon all lesions about the genital organs, seems to point to a parasitic origin.

2d. That, in distinction from the above, there is a form of puerperal fever possessing eminently contagious properties, not primarily derived from a miasm, but capable in time of generating a poisoned atmosphere. In support of this proposition we find that a patient, at a time when the general health of the ward was good, was suddenly attacked by a fever, presenting symptoms of intense severity. This patient died in a few days, and the autopsy revealed no local lesions. From the time of her attack onward, there was no period when puerperal diseases failed upon the obstetrical service. Removal of the patients from the ward in which she was attacked, a change in the medical staff, and the utmost precaution regarding the use of utensils, were of no avail. Through the agency of the nurses the disease was kept alive and active.

After the epidemic had prevailed for a season, it became

characterized by the formation of diphtheritic membranes, usually upon the external genitalia. At first prompt cauterization of the affected parts possessed a surprising influence in arresting symptoms that seemed to point to an inevitably fatal result. However, the occurrence of symptoms, preceding the completion of labor, shows that the poison found other channels of entry into the economy than the lesions resulting from childbirth. At first this miasmatic condition was not sufficient to produce fatal results. Subsequently, however, it reached a stage of development in which it alone rapidly produced death. Cauterization of the local lesions then ceased to possess any marked efficacy.

Worthy of being remembered is the following fact: That three months later, the obstetrical wards were occupied by the surgical service of Dr. Jas. R. Wood, and that in the year's time that has since elapsed, though there have been many capital operations, not one case of septicæmia or pyæmia has occurred in that section of the "tainted" hospital.